SYNOPSIS OF REQUIREMENTS FOR V2000
February 1995

The system architecture shall:

A1 Be organized into logical units independent of implementing or operating entities, contracts, or organizations.
A2 Assimilate new requirements without the formalities, oversight, and overhead of major development efforts.
A3 Eliminate functional duplications within the system.
A4 Adopt standards for reference utilities such as models.
A5 Introduce automation, where appropriate, to eliminate routine, repetitive operational procedures or functions.
A6 Utilize autonomous techniques to perform continuous fault diagnostics of both the flight and ground systems on a continuous basis.
A7 Provide a scheduling and command generation process which is a single pass system and includes self-checking and auto-diagnostic features.
A8 Transfer functionality on-board in order that the spacecraft is able to operate its on-board systems with little or no ground control.
A9 Make flight system safemodes "safer" to minimize need for continuous, high level staffing.
A10 Achieve MTTRs in minutes to hours for critical system; hours to days for non-critical systems.
A11 Be modular so as to allow several software modifications to proceed in parallel without interference.
A12 Provide backout capability to improve fault tolerance and repair.
A13 Use COTS and/or commercially available utilities to the maximum extent possible.
A14 Provide a "single" environment for each system, common to the developers, testers, and operational users with the same directory structures, file naming conventions, logical symbols, etc.
A15 Provide for automated testing, particularly for regression testing, to expedite release of capabilities.
A16 Provide self documentation of test results.
A17 Provide "non-intrusive" techniques for flight software changes to minimize down time.
A18 Provide for the ability to install ground system software changes without affecting the observing timeline.

The system shall provide:

R1 Operation of the spacecraft by the ground-flight system rather than manual intervention.
R2 The capability for quickly interrupting the timeline, assuming the availability of the necessary communication links and science specification, in order to change the science observing program.
R3 Automatic failover, where applicable, to minimize the need for human intervention and mission interruption.
R4 Capabilities to override the automated system and manually intervene in the implementation of science programs with special commanding or acquisition requirements.
R5 Capabilities within the flight computer software for operational control without the need for detailed ground intervention regarding updates to necessary reference tables, ephemerides, etc. .
R6 Procedures, software tools and utilities for the FOT to intervene and protect the next scheduled observation after a scheduled observation failure.
R7 Tools for the FOT to respond to emergencies and perform routine sustaining engineering tasks,.
R8 Safemode data via the LGA in order to expedite analysis and recovery.
R9 Capabilities to the FOT to facilitate procedural, limit and data base changes directly.
R10 Autonomous trending alerts to the FOT indicating dangerous changes in addition to limit violations.
R11 Capabilities to retrieve, decommute and subselect parameters required for analysis directly; tools shall provide easily used formats.
R12 Quick and efficient access to all data by authorized users without artificial complications imposed for security reasons.
R13 Decoupling from TDRSS scheduling constraints, particularly for downlinking science data, from the timeline scheduling process.
R14 Scheduling and command generation in a single pass involving little or no manual intervention.
R15 Early insertion of engineering proposals into the planning & scheduling system eliminating the need for the current "merge" SMS.
R16 Scheduling capabilities to permit timeline interruptability and optimize observational benefits while minimizing rework.
R17 Manual interruption of SMS processing to facilitate decisions when constraints are intentionally being violated.
R18 Assembled schedules which are legal and valid and not be rejected downstream.
R19 Commanding of standardized instrument configurations and sequences.
R20 Completion of the command load generation for a one week period within one shift following receipt of the calendar.
R21 Easily selectable instrument parameters for operators or observers.

R22 User guides and access to all information necessary to prepare valid proposals.
R23 User tools for creating highly efficient, constraint-free observing requests.
R24 User access to the status of their proposals during planning & execution.
R25 Both raw and calibrated science data to the observer.
R26 Current calibration and engineering information to enable re-calibration by the observer if desired.
R27 Science & engineering data fowarded to the observer within 48 hours of executing the observation.